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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/382,442	08/25/1999	ALAN R. REINBERG	303.522US1	5236

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EXAMINER	
BOOTH, RICHARD A	

ART UNIT	PAPER NUMBER
2812	

DATE MAILED: 10/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/382,442	REINBERG, ALAN R.	
	Examiner	Art Unit	
	Richard A. Booth	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,26-32 and 35-39* is/are pending in the application.

4a) Of the above claim(s) *3,26-32 and 35-39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2 and 4-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-5, and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi, U.S. Patent 5,145,797 in view of Lisenker et al., WO 94/19829 and further in view of Admitted prior art.

Nakanishi shows the invention substantially as claimed including providing a semiconductor layer 1 having a surface; heating the layer in an atmosphere during thermal oxidation; fabricating a memory circuit having a programming operation and an erasing operation, comprising single bit data using the semiconductor layer 1, the fabricating comprising fabricating a gate region 3 in the layer; treating a portion of the surface to form a thin layer 7 of insulator film adjacent to the gate region and under the gate region and forming a second gate region 5 over the first gate region (see figs. 1A-1D and col. 2-lines 28-66).

Nakanishi fails to expressly disclose providing a semiconductor layer having a surface, heating the layer in an atmosphere comprising a hydrogen isotope wherein the hydrogen isotope is incorporated into the layer; and heating the gate region and the thin layer in an atmosphere comprising a hydrogen isotope.

Admitted prior art discloses performing a post-metal passivation process using hydrogen (see page 4, lines 27-30 of specification). Additionally, Lisenker et al. discloses replacing hydrogen with deuterium in a polysilicon deposition process or in a passivation process or in any process in which hydrogen is employed (see paragraph bridging pages 8-9). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Nakanishi so that the deposition of the polysilicon layers 3 and 5 and the passivation process is employed using deuterium as suggested by the combination of Lisenker et al. and the Admitted prior art because bonds formed with deuterium are stronger than those formed with hydrogen (see page 9, lines 5-14)

With respect to claims 4-5, note that the thermal oxidation process recited above will be at such a temperature as to oxidize and anneal the semiconductor layer.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi, U.S. Patent 5,145,797 in view of Lisenker et al., WO 94/19829 and further in view of Admitted prior art as applied to claims 1-2, 4-5, and 7-10 above, and further in view of Nakajima et al., U.S. Patent 5,397,724.

Nakanishi, Lisenker et al., and the Admitted prior art are applied as above but fail to expressly disclose subjecting the semiconductor to ammonia enriched in hydrogen isotope at an elevated temperature.

Nakajima et al. teaches the formation of a memory device in which a passivation layer 32 of silicon nitride is formed thereover by CVD (see fig. 8F and col. 7-lines 42-

57). Note that it is well known in the art that silicon nitride is commonly formed through CVD using an ammonia precursor. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Nakanishi modified by Lisenker et al. and the Admitted prior art so as to subject the semiconductor to ammonia enriched in hydrogen isotope because Nakajima et al. suggests using silicon nitride as an overlying passivation layer for a memory device and Lisenker et al. teaches the desirability of replacing hydrogen with deuterium in all semiconductor processing steps.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi, U.S. Patent 5,145,797 in view of Lisenker et al., WO 94/19829 and further in view of Admitted prior art as applied to claims 1-2, 4-5, and 7-10 above, and further in view of Sheu, U.S. Patent 4,840,917.

Nakanishi, Lisenker et al., and the Admitted prior art are applied as above but fail to expressly disclose forming a field oxide in the substrate followed by annealing in a hydrogen isotope material at a temperature greater than 800 Celsius.

Sheu discloses forming field oxides followed by performing hydrogen annealing at 1000 Celsius in order to incorporate hydrogen into the active area (see col. 1-lines 27-35). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Nakanishi modified by Lisenker et al. and the Admitted prior art so as to form a field oxide followed by annealing with hydrogen because this reduces the surface state density of the device.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the hydrogen with deuterium as suggested by Lisenker et al. because of the stronger bonds that silicon forms with deuterium.

Response to Arguments

Applicant's arguments filed 10/3/03 have been fully considered but they are not persuasive. Applicant argues that Nakanishi and Lisenker et al. cannot be combined because one teaches dry oxidation while the other reference teaches wet oxidation. However, the above mentioned references are not being applied for this reason. Furthermore, regarding the fact that Nakanishi fails to disclose particulars about the deposition process, Lisenker et al. clearly teaches performing deposition with deuterium.

Conclusion

This is a RCE of applicant's earlier Application No. 09/382,442. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 308-7724 for regular communications and 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.

October 9, 2003

Richard A. Booth
Primary Examiner
Art Unit 2812